AMENDMENTS TO THE CLAIMS

1. (currently amended) A method for achieving charge normalization when stimulating tissue using a neural stimulation implant system having multiple electrodes, and further having a differential amplifier that allows a clinician to record electrically evoked compound action potentials (ECAP) in response to an applied stimulus, comprising:

applying a stimulus at a fixed pulse width and magnitude sufficient to elicit an ECAP response to be observed;

~~determining a threshold neural response elicited from application of at least one stimulus having a known amplitude and pulse width to a first electrode of the multiple electrodes;~~

determining the charge associated with the stimulus that produced the ECAP ~~threshold neural~~ response ~~at the first electrode where the stimulus was applied~~; and

setting the program levels of the stimuli applied by the implant system during its operation to ~~others of~~ the multiple electrodes to stimuli having approximately the same charge as the charge of the stimulus that produced the ECAP ~~threshold neural~~ response ~~at the first electrode where the stimulus was first applied, whereby charge normalization of the applied stimuli to all of the multiple electrodes is achieved~~.

2. (currently amended) The method of Claim 1 further including ~~wherein~~

determining a threshold neural response ~~comprises~~ elicited from application of at least one stimulus having a known amplitude and pulse width to a first electrode of the multiple electrodes,

applying a multiplicity of stimuli, each applied stimuli having a different intensity level associated therewith,

measuring a corresponding neural response associated with application of each one of the multiplicity of stimuli,

defining a data point for each applied stimulus and its corresponding neural response, thereby defining a multiplicity of data points, and

analyzing the multiplicity of data points to determine the threshold neural response.

3. (original) The method of Claim 2 wherein measuring a corresponding neural response associated with application of each one of the multiplicity of stimuli comprises measuring a first peak N1 of one polarity of a neural response, and measuring a second peak P1 of an opposite polarity of the neural response, and determining the measured neural response to be the N1-P1peak-to-peak difference.

4. (original) The method of Claim 3 wherein analyzing the multiplicity of data points to determine the threshold neural response comprises:

plotting the multiplicity of data points on a graph, wherein the intensity level of the applied stimulus comprises a first axis of said graph, and the measured neural response associated with the applied stimulus comprises a second axis of said graph;

fitting a data line to the multiplicity of data points plotted on the graph;

determining an intersection point at which an extrapolation of the data line intersects with the first axis of the graph; and

setting the threshold neural response as the intersection point.

5. (original) The method of Claim 4 wherein fitting a data line to the multiplicity of data points comprises fitting a straight line to the multiplicity of data points.

6. (original) The method of Claim 2 wherein applying a multiplicity of stimuli, each applied stimuli having a different intensity level associated therewith, comprises applying stimuli having different pulse amplitudes and a fixed pulse width, and wherein determining the charge associated with the stimulus that produced the threshold neural response comprises multiplying the amplitude of the threshold neural response by the fixed pulse width.

7. (original) The method of Claim 2 wherein applying a multiplicity of stimuli, each applied stimuli having a different intensity level associated therewith, comprises applying stimuli having different pulse widths and a fixed pulse amplitude, and wherein determining the charge associated with the stimulus that produced the threshold neural response comprises multiplying the pulse width of the threshold neural response by the fixed pulse amplitude.

8. (cancelled)

9. (cancelled)

10. (currently amended) A neural stimulation system comprising an implantable pulse generator, an electrode array having multiple electrodes attached to the pulse generator, a differential amplifier for recording electrically evoked action potentials (ECAP), and control circuitry for controlling operation of the implantable pulse generator so that charge normalization is achieved, wherein the control circuitry includes:

means for recording when an applied stimulus elicits an ECAP to occur;

means for determining the charge associated with the applied stimulus that produced the ECAP;

~~means for determining a threshold neural response elicited from application of at least one stimulus having a known amplitude and pulse width to a first electrode of the multiple electrodes;~~

~~means for determining the charge associated with the stimulus that produced the threshold neural response at the first electrode where the stimulus was applied;~~ and

means for setting the program levels of the stimuli applied by the implant system during its operation ~~to others of the multiple electrodes~~ to stimuli having approximately the same charge as the charge that elicited the ECAP ~~of the stimulus that produced the threshold neural response at the first electrode where the stimulus was first applied, whereby charge normalization of the applied stimuli to all of the multiple electrodes is achieved~~.

11. (currently amended) The neural stimulation system of Claim 10 further including:

means for determining a threshold neural response elicited from application of at least one stimulus having a known amplitude and pulse width to a first electrode of the multiple electrodes;

means for determining the charge associated with the stimulus that produced the threshold neural response at the first electrode where the stimulus was applied; and wherein the means for determining a threshold neural response comprises

means for applying a multiplicity of stimuli, each applied stimuli having a different intensity level associated therewith,

means for measuring a corresponding neural response associated with application of each one of the multiplicity of stimuli,

means for defining a data point for each applied stimulus and its corresponding neural response, thereby defining a multiplicity of data points, and

means for analyzing the multiplicity of data points to determine the threshold neural response.

12. (original) The neural stimulation system of Claim 11 wherein the means for measuring a corresponding neural response associated with application of each one of the multiplicity of stimuli comprises means for measuring a first peak N1 of one polarity of a neural response, and means for measuring a second peak P1 of an opposite polarity of the neural response, and means for determining the measured neural response to be the N1-P1peak-to-peak difference.

13. (original) The neural stimulation system of Claim 11 wherein the means for analyzing the multiplicity of data points to determine the threshold neural response comprises:

means for plotting the multiplicity of data points on a graph, wherein the intensity level of the applied stimulus comprises a first axis of said graph, and the measured neural response associated with the applied stimulus comprises a second axis of said graph;

means for fitting a data line to the multiplicity of data points plotted on the graph;

means for determining an intersection point at which an extrapolation of the data line intersects with the first axis of the graph; and

means for setting the threshold neural response as the intersection point.

14. (original) The neural stimulation system of Claim 13 wherein the means for fitting a data line to the multiplicity of data points comprises means for applying a linear-regression line to the multiplicity of data points.

15. (original) The neural stimulation system of Claim 10 wherein the neural stimulation system comprises an implantable cochlear stimulation system.

16. (original) The neural stimulation system of Claim 10 wherein the neural stimulation system comprises a spinal cord stimulation system.

17. (currently amended) The method of Claim 1 wherein the fixed pulse width is between 11 μs and 75 μs.

18. (canceled)

19. (currently amended) The method of Claim 2 ~~1~~, wherein:

determining the threshold neural response comprises:

measuring a plurality of neural responses elicited from a corresponding plurality of applied stimuli, each applied stimuli having a different intensity level associated therewith; and

determining a tNRI value from the measured plurality of neural responses;

determining the charge associated with the stimulus comprises:

determining the charge level associated with the tNRI value, where charge level is defined as pulse width X pulse amplitude; and

setting the program levels comprises:

setting the programmed levels used by the cochlear implant system to stimuli having approximately the same charge as the charge associated with the tNRI value.

20. (previously presented) The method of Claim 19 wherein determining a tNRI value comprises:

plotting the measured neural responses as data points on a graph having the applied stimuli as a first axis and the measured neural response as a second axis,

making a straight line approximation of the plotted data points, and

determining the tNRI value as the value corresponding to the intersection of the straight line approximation of the plotted data points with the first axis.